Transportation Synthesis Report

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Optimal Roundabout Pavement Design

Prepared for
WisDOT District 3

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Transportation Synthesis Reports (TSRs) are brief summaries of currently available information on topics of interest to WisDOT technical staff in highway development, construction and operations. Online and print sources include NCHRP and other TRB programs, AASHTO, the research and practices of other state DOTs, and related academic and industry research. Internet hyperlinks in TSRs are active at the time of publication, but changes on the host server can make them obsolete.

REQUEST FOR REPORT

Although a wealth of information is available on roundabout geometric design, relatively little exists on optimal pavement design for roundabouts. The RD&T Program was asked to find available information in published literature and among other states. The references we found below provide details on approaches taken in Kansas and recommendations from both a concrete pavement association (U.S.) and an asphalt pavement association (Australia).

DOMESTIC STUDIES AND GUIDELINES

"Curb and Pavement Design," *Kansas Roundabout Guide,* October 2003
http://www.ksdot.org/burtrafficeng/Roundabouts/Roundabout_Guide/Section_6.4_Curb_and_Pavement.pdf.
This KDOT study reviews current pavement design practices in five roundabout projects in Kansas, including thickness of base and surface, and gives recommendations on both curb sizing and pavement types. Both concrete and asphalt were used in the roundabouts. Concrete is recommended for its longer life and ability to stand up to truck traffic, but if construction is done under traffic, asphalt is required. Other recommendations are for truck apron material and joint patterning.

"Six Keys to Constructing Concrete Roundabouts," *Concrete Pavement Progress*, American Concrete Pavement Association, August 6, 2004
http://www.pavement.com/CPP/2004/CPP-080604.pdf. Scroll about one-third down into this publication to find the association's roundabout advice. Drawings illustrate the guidelines on roundabout joint placement and construction sequencing.

INTERNATIONAL STUDIES AND GUIDELINES

A Guide to Asphalt Mixes for Roundabouts, Australian Asphalt Pavement Association, Advisory Note 3
http://www.aapa.asn.au/docs/no3.pdf. Recommendations are made for optimal performance of asphalt roundabout pavements under extremely heavy traffic conditions, including density, binders, deformation resistance, and patch depth.

"Bituminous Surfacing for Intersections on Light and Medium Duty Flexible Pavements," Australian Asphalt Pavement Association, Advisory Note 15
http://www.aapa.asn.au/docs/no15.pdf. This Australian association produced guidelines for a selection of surfacing at intersections, including roundabouts, for pavements that are designed for sprayed seals or thin, non-structural, asphalt surfacing and that carry medium to light traffic levels.